

Rehabilitation/Replacement of Route 44 over Mantua Creek Structure No. 0806-151

***Borough of Paulsboro &
Township of West Deptford
Gloucester County***

June 30, 2004



Presented by:

Division of Project Planning and Development

Problem Statement:

The overall condition of this structure is listed as poor. The bridge is structurally deficient with a sufficiency rating of 47. The bridge has deteriorated to the point that it requires extensive rehabilitation / replacement.

Initial NJDOT cost estimate for replacement - \$25 million

Existing Bridge

Mantua Creek



• Vertical Lift Bridge

- 85' Steel through girder / floorbeam / stringer movable lift span
- (2) 40' concrete encased steel multi-stringer approach spans

• Bridge Operation Data

- Average of 41 openings/month (Summer Months)
- Average Vessel Height – 26'
- Maximum Vessel Height – 41'
- Max. Ex. Navigable Clearance – 64'

• Built in 1935

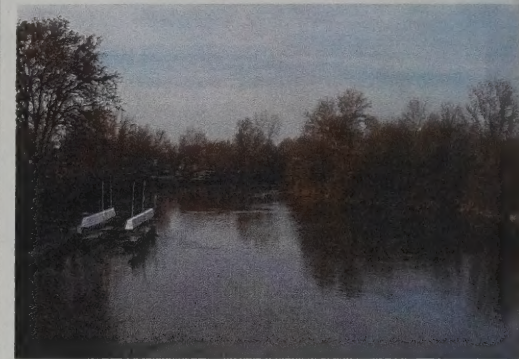
• Individually Eligible for Listing on National & State Register of Historic Places

- One of three of its type
- Historically and technically significant

• Sufficiency Rating of 47.7

• Overall Condition - Poor

• No Load Posting



- Tidally Influenced navigable waterway
- Rt 44 crossing approximately 2 miles east of confluence with the Delaware River
- Creek used primarily by pleasure craft in summer months
- Marina approximately 500' east of bridge

Existing Conditions

• Superstructure

- Deteriorated through girder bottom flange angles on the lift span and west end floorbeam

• Scour

- Scour exists along the west abutment exposing the pile-supported footing
- Stage II Scour Report stated that the depth of scour for 500-year flood below estimated tip of pile

• Roadway

- Substandard vertical geometry
- "Kink", 10°-angle point, in the horizontal alignment of the south approach
- No indicator accidents



Lift span floorbeam, south end, looking north. Note the section loss in the web and flange and the holes in the web.

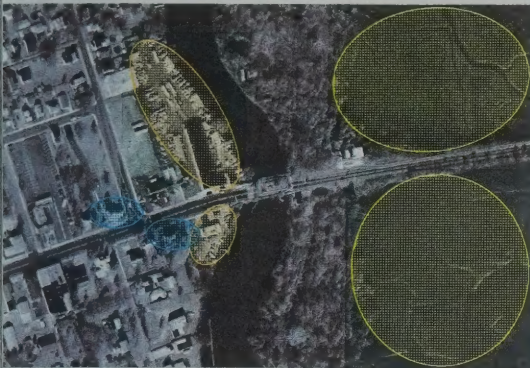


General view of the lift span.



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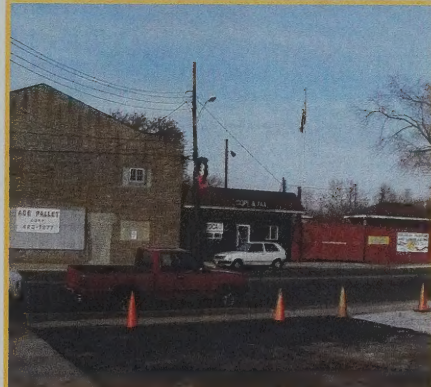
Constraints



Potential Hazardous Waste or Contaminated Sites



Historic Properties



Alternatives Analysis

- **Alt. 1 - Replacement - High Level Fixed Structure**
 - Provide a fixed structure with a 25' minimum clearance
 - Major impacts to community, environmental & historic assets
 - Not supported by local officials, SHPO & FHWA
 - High Cost
- **Alt. 2 - Replacement - Lift-Span Bridge**
 - Replace the structure "in-kind"
 - Eliminate the "kink" in the approach roadway
 - Not supported by SHPO
 - Eliminates an eligible historic resource
 - High cost
- **Alt. 3 - Rehabilitation**
 - Structural Repairs (Increased load carrying capacity)
 - Mechanical and Electrical Repairs
 - Maintains Historic Resource
 - Supported by all stakeholders
 - Opportunity to incorporate CSD treatments to enhance the bridge as a "Gateway to Paulsboro" (Reinstalling original style light fixtures on bridge, suitable paint scheme, architectural details to operator's house, powder coated guiderail)
 - *Most Cost Effective Solution*

Recommendation

Based upon a detailed review of the latest NBIS inspection report, cursory field visits, and structural analysis, it was determined that it is feasible to rehabilitate the existing superstructure, substructure and mechanical and electrical systems and obtain 25 to 35 additional years of service life. The bridge approach span decks may require replacement depending upon the results of the recommended deck condition survey. The lift span deck may also require replacement dependent upon the additional dead load introduced by the proposed repairs. **Rehabilitating the existing lift-span bridge satisfies the project need at a substantially lower cost than replacement. The estimated cost of rehabilitation is \$3.6 million.** The rehabilitation should also raise the bridge's sufficiency rating to 80 in order to remove it from the Department's select list.

It is not recommended to upgrade the substandard horizontal, vertical, and cross slope deficiencies as part of this project. Design exceptions for substandard superelevation, minimum radius, and vertical curve stopping sight distance should be prepared during preliminary design.

The Route 44 bridge is a historically and technically significant rare 20th century bridge. Rehabilitation provides for additional service life of the historic structure, meets the public official's recommendations and allows the Borough of Paulsboro to maintain the "Gateway" to their community.

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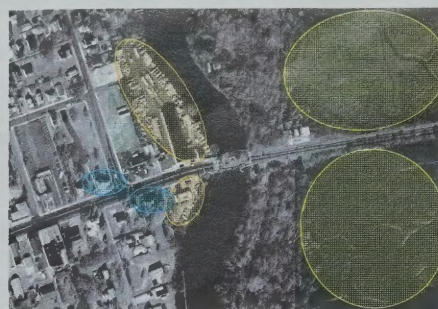
"Gateway to Paulsboro"

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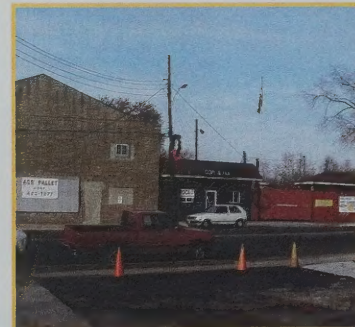
Constraints



Wetlands



Potential Hazardous Waste or Contaminated Sites



Historic Properties



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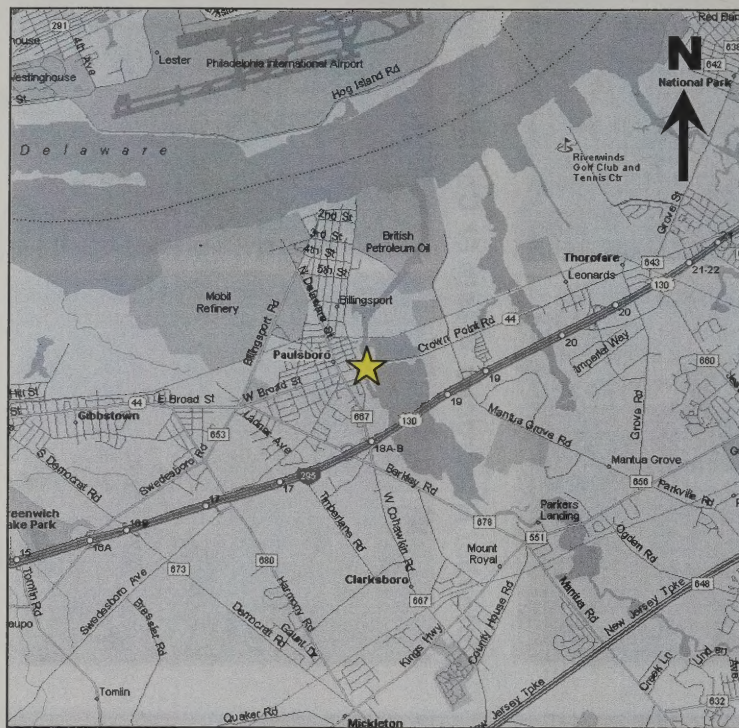


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Project Location

Borough of Paulsboro and Township of West Deptford - Gloucester County



Project Team

Division of Project Planning and Development (DPPD):

Director: Gary A. Toth
Manager – South: Thomas Saylor
Supervising Engineer – South: Tom Carbone
Lead Engineer: Tony Obidike

Additional DOT Personnel Involved:

Rick Hammer from Project Management; Patricia Feliciano from Community Relations; Dan Ioseb from Structures; Mark Hauske from Value Engineering; Nick Caiazza, Harry Moore and Sue Leedom from Environmental Services.

Outside Agencies:

Lourdes Castaneda and Shay Burrows from FHWA.

Consultant:

Vollmer Associates LLP

